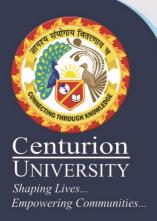


## **Domain: Smart Agriculture**

## **Course:** Growing of Hydroponics Spinach

## **Project topic:** Nutrient preparation





### **PREPARATION OF NUTRIENT STOCK SOLUTION:**

Plant requires total 17 essential elements for its healthy growth; these 17 essential nutrients are divided into macro nutrients and micro nutrients.

#### **STEPS OF PREPARING STOCK SOLUTIONS:**

- Measure the required amount of chemical on the weighing balance.
- Place the measured chemical into the 250 ml volumetric flask.
- 100 ml of distilled water is added and crystals were dissolved by manual shaking.
- Again 100ml of distilled water is added to ensure all the crystals were dissolved.
- Then finally 250 ml stock was prepared.
- Preserve in the glass jar by proper labeling.



#### Fertigation recipes for hydroponically grown spinach

Nutrient	Concentration in nutrient solution (ppm)
Nitrogen (N)	145 - 165
Phosphorus (P)	23 - 35
Potassium (K)	230 - 250
Calcium (Ca)	95 - 110
Magnesium (Mg)	20 - 30
Sulphur (S)	30 - 45
Iron (Fe)	1.5 - 2.5
Manganese (Mn)	0.2 - 0.5
Boron (B)	0.5 - 0.8
Zinc (Zn)	0.1 - 0.2
Copper (Cu)	0.05
Molybdenum (Mo)	0.05



**pH and EC of nutrient solution** •A pH of **5.8** is considered optimum for the described spinach growing system, however a range of **5.6-6.0** is acceptable.

•Nutrient deficiencies may occur at ranges above or below the acceptable range.

•Higher EC will prevent nutrient absorption due to osmotic pressure and lower level severely affect plant health and yield.

•Appropriate management of EC in hydroponics technique can give effective tool for improving vegetable yield and quality

•EC(dSm-1) between **1.8 to 2.3** is advised for spinach.

•During colder periods the EC can be slightly higher but during high temperatures it is important not to let the EC go above **2.0** 





# Thank you...